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Brennan 5-84-2-6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): J.M. Brennan et al.  
Case: 5-84-2-6  
Serial No.: 10/784,756  
Filing Date: February 23, 2004  
Group: 2811  
Examiner: Nitin Parekh

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: *Wayne L. Ellenbogen* Date: April 28, 2005

Title: Semiconductor Device with  
Improved Thermal Characteristics

TRANSMITTAL LETTER

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith is the following document relating to the above-identified patent application:

(1) Response to Restriction Requirement.

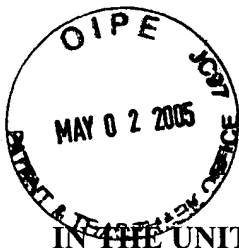
There is no additional fee due in conjunction with the response. In the event of any non-payment or improper payment of a required fee, the Commissioner is hereby authorized to charge or to credit **Ryan, Mason & Lewis, LLP Deposit Account No. 50-0762** as required to correct the error.

Respectfully submitted,

*Wayne L. Ellenbogen*

Date: April 28, 2005

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RESPONSE TO RESTRICTION REQUIREMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In an Office Action dated April 5, 2005, the Examiner required restriction of claims 1-20 to one of the following two groups of claims: (i) claims 1-16 and 20 (Group I); and (ii) claims 17-19 (Group II). Specifically, the Examiner contends that the inventions set forth in Groups I and II are distinct in that "the device of group I invention could be made by the processes different from those of group II invention" (Office Action; page 2, paragraph 2). Applicants respectfully disagree with this contention and respectfully request reconsideration and withdrawal of the requirement for restriction for at least the reasons given below.

Applicants submit that the apparatus set forth in claims 1 and 20 cannot be made by a process other than and materially different from the method set forth in claim 17, and that the method of claim 17 cannot be used to form a product other than and materially different from the product set forth in claims 1 and 20. Accordingly, Applicants assert that, in the interest of conservation of resources for the Patent Office as well as the Applicants, claims 1- 20 should be examined together. The Examiner provides an example in an attempt to show distinctness of the two indicated groups

of claims, stating that “sputtering the substrate to form the channel in the desired area instead of etching” (Office Action; page 2, paragraph 2). Applicants assert, however, that none of the claims of the present application requires etching. While it is true that claim 17 does not limit the exact fabrication process used to form the channel in the semiconductor device, claim 17 does specify, for example, the characteristics and location of the channel so as to provide an enhanced thermal conduction path in the device.

Specifically, the table below illustrates the correspondence between the elements of claims 1, 17 and 20.

CLAIMS 1 AND 20	CLAIM 17
“a semiconductor substrate; an active region formed in the substrate proximate an upper surface of the substrate, the active region including at least one circuit element formed therein”	“forming one or more active regions in a semiconductor substrate proximate an upper surface of the substrate, the active region including at least one circuit element formed therein”
“at least one channel formed in a back surface of the substrate opposite the upper surface of the substrate, the at least one channel being formed proximate the active region”	“forming at least one channel in a back surface of the substrate opposite the upper surface of the substrate, the at least one channel being formed proximate the active region”
“wherein the at least one channel is substantially filled with at least one layer of a thermally conductive material and configured so as to provide a thermal conduction path for conducting heat away from the active region”	“filling the at least one channel with at least one layer of a thermally conductive material so as to provide a thermal conduction path for conducting heat away from the active region”

As apparent from the above table, each of the steps recited in the method of claim 17 has a corresponding element in the apparatus set forth in claims 1 and 20. Applicants submit that the apparatus set forth in claims 1 and 20 cannot be made by a process other than and materially different from the process set forth in claim 17, and that the process of claim 17 cannot be used to form a product other than and materially different from the product set forth in claims 1 and 20. Accordingly, the inventions set forth in the subject claims are properly linked to one another and

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should be considered together. Withdrawal of the restriction requirement in the present application is therefore respectfully solicited.

Notwithstanding the above traversal, Applicants hereby provisionally elect the claims of Group I, namely, claims 1-16 and 20, for prosecution on the merits.

It is believed that there is no fee due in conjunction with the present response. In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Ryan, Mason & Lewis, LLP Deposit Account No. 50-0762** as required to correct the error.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Wayne L. Ellenbogen", with a stylized flourish at the end.

Date: April 28, 2005

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